

## Book Reviews

*The Lancelets: A New Look at Some Old Beasts.* Israel Journal of Zoology, vol. 42 (Suppl.). Edited by C. GANS, N. KEMP and S. POSS. (Pp. 446; illustrated; \$60 paperback; ISSN 0021 2210.) Available from Carl Gans, 25012 Slow Turtle Cove, Austin, TX. 1996.

The lancelets, marine cephalochordates (more commonly, if incorrectly, known as 'amphioxus') are well known to all young biologists from their simplest textbooks and earliest practical classes, because of their perceived crucial position in relation to the evolutionary origins of the vertebrates. The similarities are clear but the true nature of their relationship between the invertebrates and the vertebrates is still a subject of discussion and of disagreement among comparative anatomists. Was it ever thus! In 1774, Pallas mentioned a lancelet for the first time in his natural history, defining it as a mollusc. It took 60 years for this assignation to be reversed, and the critical position of the cephalochordates in relation to the origins of vertebrates to be recognised. Thus in the 1860s, at precisely the same time that the study of evolutionary origins was becoming respectable, lancelet biology was coming of age.

Unfortunately it was also a period when great taxonomical debates were *de rigueur*, and since few of the studies, which made great claims for a smooth evolutionary pathway, actually demonstrated such unequivocal findings, the literature of the day provided a basis for great confusion and often considerable asperity.

Lancelets were originally linked to the vertebrates because of their segmented musculature, surrounding a notochord, and they have often been erroneously described as fishes. They do, however, have very major differences, not least of which are their lack of many of the features common to all vertebrate brains and their lack of paired external receptors.

The confused status of most of the data on comparative anatomy, biochemistry and taxonomy of the group has therefore been a problem for evolutionary theory and also for the comparative biologist. It is only now as a result of the powerful techniques available to us with the development of gene cloning and PCR technology that we can hope to define the true nature of the relationship of lancelets to our vertebrate evolutionary ancestry.

Before such aspirations can be achieved, however, the current level of our understanding has to be defined so that results of the powerful new analytical tools can be placed in context.

This volume, a specially prepared supplement to the *Israel Journal of Zoology*, which was derived from, but is not a symposium proceedings of the IVth International Congress of Vertebrate Morphology, held in Chicago in 1994, attempts to do just that. Its authoritative chapters on lancelet taxonomy, ecology and anatomy, leading on to molecular biology, provide the background against which the new knowledge will present itself.

Already, in one of the later chapters, on the molecular biological aspects of lancelets, emphasis is placed on the homeobox genes, which in lancelets are located in a single cluster—as in other invertebrates. The genomic organisation of these genes, however, is very similar to that of the vertebrate. It would seem from findings presented, even from the present limited number of genes analysed, which is just about sufficient to draw conclusions, that the lancelet

body plan is indeed likely to be archetypal, and likely only to have diverged in minor ways from the primitive vertebrate ancestors.

The evolutionists are thus probably right, despite all the confusion, and things might even be more straightforward than we thought. This volume certainly goes a long way toward helping us to reach that ultimate conclusion. It is to be recommended as the standard work on this much-studied, very important but still enigmatic group.

R. J. ROBERTS

*Essentials of Human Embryology.* By WILLIAM J. LARSEN. (Pp. xii+394; fully illustrated; £22 paperback; ISBN 0 443 07514 X.) Edinburgh: Churchill Livingstone. 1997.

Changes in medical education over the past 3 decades have not been kind to embryology courses. Teaching embryology today means attempting to cover the subject in sufficient depth for insight and understanding to be possible, but in a fraction of the time allocated to it in the past. But embryology has not been immune from the molecular revolution that has affected medical teaching, research and practice—in research at least, it has been at the forefront. As a consequence, the old teaching methods that treated embryos merely as a sequence of changing shapes can no longer be justified. At a time when advances in reproductive biology are presented to the general public in broadsheet and tabloid newspapers alike, future doctors need to understand preimplantation and early postimplantation development well enough for informed ethical discussion. Furthermore, recent advances in clinical and experimental genetics enable congenital malformations to be explained in terms of molecular developmental mechanisms, not just presented as illustrations of what can happen when organogenesis goes wrong. Embryology was once a subject whose appeal was limited to those with good visual minds; now it is an exciting intellectual challenge, relevant to the whole of society. The challenge to the teacher, and to the writers of textbooks, is to maintain the interest of those who find descriptive embryology hard to relate to, but want an in depth understanding of, for instance, why an embryo with a Y chromosome develops so differently from one that has not.

Those of us who have always tried to communicate an understanding of the mechanisms of normal and abnormal development alongside descriptive embryology were delighted by the support given to this approach by W. J. Larsen's ground-breaking textbook *Human Embryology* when the first edition was published in 1993. Alongside the 3-dimensional-effect drawings and excellent descriptive text, this book presented not only clinical applications (common to most competitor books) but accessible concepts and experimental data from the most recent articles in developmental biology. Late 1997/early 1998 has seen 2 new editions of this work. One of these represents an updating and expansion of the original text, a second edition increased in length from 479 to 512 pages. The other cuts out some of the sections not essential to those who want to understand medical-related embryology but have no interest in, for instance, how a transgenic mouse is made. This book, *Essentials of Human Embryology*, has 394 pages; it is a little more than two-thirds the price of the full version, and is aimed at the mass medical student market. (Interestingly, my first year students have all opted for the longer version.)

The quantitative difference between the 2 new books is easily illustrated by reference to the chapter on limb development. In *Essentials* this is 22 pages long, in contrast to the 29 of *Human Embryology* (both excluding references). The content difference lies in the 'Experimental Principles' section of the longer version, which is summarised and incorporated into a section entitled 'Applications to Clinical Practice' in *Essentials*. In spite of this condensation, the shorter account explains, for instance, the experimental basis for our understanding of the roles of *HOXD* genes in patterning the limb skeleton, integrated with a description of human syndactyly due to *HOXD* mutation. So, even for those who opt for the shorter book, the message that genes control embryonic development is up front.

Not every system is dealt with in this way. Development of the aortic arches is followed in both books by sections on errors in remodelling of the great vessels which are purely descriptive, though genetic causes are known. Instead, this section illustrates the evolutionary principles of embryology, with reference to the branchial vasculature of fishes as the evolutionary precursor of the aortic arches of the mammalian embryo.

One omission from the early development section disappointed me: the cloning of Dolly the sheep early last year is not mentioned in either book, so no scientific basis is provided for informed debate on human cloning. However, as I write, the current concern of the journalists who decide the ethical issue of the week is 'designer babies'; Larsen does not mention this term, but he does explain that individual blastomeres can be removed from pre-implantation human embryos for genetic testing.

Larsen's books, whether in the *Essentials* or the complete form, are the true successors of Hamilton, Boyd and Mossman's *Human Embryology*, 4 editions of which were published between 1945 and 1972. Not since then has there been an embryology book which gave such a good basis of description while at the same time being uncompromisingly set to appeal to the intelligent medical student, nor one which gives such a wealth of references for the more advanced student and researcher. To have chosen the same title is apt.

G. M. MORRISS-KAY

*Fitting the Task to the Human: A Textbook of Occupational Ergonomics*, 5th edn. By K. H. E. KROEMER and E. GRANDJEAN. (Pp x+416; illustrated; £16.95 paperback; ISBN 0 7484 0665 4.) London: Taylor & Francis. 1997.

Professor Etienne Grandjean, who died in 1991, was renowned for his contributions to occupational ergonomics and the breadth of vision he brought to his subject. It is fitting that his well-known book now appears in a revised edition after 9 years. Karl Kroemer, a noted ergonomist, and Richard Steele, publisher of Taylor & Francis, have joined forces to produce this 5th edition as a homage to Grandjean. The result is a handsome book, enhanced by Jim Wilkie's restrained and beautifully proportioned cover design. The adoption of Times fonts and the use of bold instead of italic for the margin's subtitles make it much easier to scan and read.

As before, this edition contains 21 chapters and the titles are unchanged save that the politically correct 'human' has ousted 'man'. The wording of most chapters is virtually unchanged although each now concludes with a short summary. All the original figures are retained and one is added. A few tables of anthropometric and psychophysical

data have appeared which did not exist at the time of the previous edition. For those familiar with the 4th edition, the first impression may be that the book is simply a repeat, albeit in a more attractive format. Grandjean's approach to occupational ergonomics, his balance and choice of emphases certainly remain intact, which is to be expected in a homage of this nature. The only exception that this reviewer detected lay in value judgements applied to the 4-day working week which reflect findings in the last decade.

It is only on detailed inspection that evidence of substantial and careful revision emerges. Of the 300 references, 71 are new and 63 of those in the previous edition have been omitted. The changes are spread throughout many chapters and serve to strengthen rather than modify Grandjean's message. All this reflects the care which has been taken in the revision.

The references span 70 years. Two or 3 references a year are quoted between World War II and 1960. Since then and to the present, 6 or 7 references appear for every year, a pattern which suggests a healthy and steady development of the subject. Occupational ergonomics is a broad subject. This book is not to be regarded as a text for specialists in the topics of particular chapters. The accounts of muscle contraction, electromyography, the nervous control of movement, mental activity, skill acquisition and vision would possibly appear superficial to the experts in those fields. Some short sections, such as that on the nerve action potential could be omitted without loss because of their near-irrelevance. The important consideration is whether the book can help the ergonomist to develop the multi-disciplinary approach which is essential for practising the subject, which it does. The book is a worthy successor to the previous editions and provides a useful and up-to-date text for students and practitioners of occupational ergonomics.

DON GRIEVE

*Dental Anthropology*. By SIMON HILLSON. (Pp. xvi+373; illustrated; £55/\$74.95 hardback, £19.95/\$29.95 paperback; ISBN 0 521 45194 9 hardback, 0 521 56439 5 paperback.) Cambridge: Cambridge University Press. 1996.

The nature of enamel, dentine and cementum is such that teeth are the most durable components of the human skeleton. This durability is reflected in the predominance of dental elements in the hominid fossil record. Teeth are also unique in that their developmental history is preserved in their microstructure. The periodic and circadian nature of their development means that they offer the potential to investigate ontogeny as well as providing information about function and phylogenetic history. Specifically the clocklike regularity of their development allows estimates to be made of absolute rates of growth of fossil species. Combined with observations about the sequence of eruption of the dentition these data are now providing palaeontologists with unprecedented information about the developmental basis and evolutionary context of the dentition of modern humans. When these factors and opportunities are considered alongside the potential that teeth have for the interpretation of the diets of our extinct human relatives, it is little wonder that anthropologists, and particularly palaeoanthropologists, seem unduly preoccupied with the dentition.

Simon Hillson has tackled the difficult task of writing a text on the dentition that will be of interest to anthropologists. However, it is not clear to me what particular constituency he had in mind. In its present form the book is probably too detailed to be a student textbook, yet it is not comprehensive enough to be used as a 'manual' for those

embarking on a first-hand study of dental evidence. There is, for example, no guidance about how teeth are measured. This may seem a trivial matter, but those who are charged with producing measurements of a collection of teeth will search in vain for hints about how to deal with irregularly shaped, worn and incomplete teeth.

Anyone who has been given the task of teaching students about dental microstructure will appreciate the time and effort that Hillson has invested in the sections that deal with enamel, dentine and cementum. However, these topics cry out for imaginative and well thought-out diagrams to illustrate the way that ameloblast activation, secretory activity and life history combine to produce the complex microstructure that we observe. I found the section on dentine particularly informative and it certainly improved my understanding of the link between its development and microstructure.

As a palaeoanthropologist, I not surprisingly paid particular attention to the author's creditable attempt to set the dentition of modern humans in an evolutionary context. He does this by referring to the departures from the modern-human morphology that are shown by the main fossil hominid taxa. These are generally sensible and well illustrated summaries, but readers will have scant appreciation of their significance because there is little, or no, contextual information. For example, without knowing about the form of the dentition of the closest living relatives of modern humans, which provide the best guide to the ancestral condition of the dentition of the early hominids, the evolutionary significance of much of the information is lacking. There are also signs that some of the information is at least second-hand. For example, there is little risk of hominid molar teeth being confused with bear and pig molars, but they are easily confused with the premolars of these animals.

There is much to appreciate in this volume and readers who are seeking an introduction to the dental 'underworld' will be well served. Hillson's misfortune is that a book of this sort is inevitably going to be compared with Aiello & Dean's textbook on human evolutionary anatomy. The latter is not only an excellent text for advanced students, but it also contains information, analyses and insights of a standard that lead to it being regularly cited in research papers. It remains to be seen whether his colleagues award Hillson's text a similar accolade.

BERNARD WOOD

*High-Yield Gross Anatomy.* By RONALD W. DUDEK. (Pp. vii + 136; illustrated; £9.95 paperback; ISBN 0683 18215 3.) Baltimore and London: Williams & Wilkins. 1997.

As the author states in the preface, this is gross anatomy at its irreducible minimum. The book is arranged on a regional basis. There are simple line drawings, tables, radiographs and other images, often with numbered 'spot' tests.

The book is designed for students preparing for the United States Medical Licensing Examination (USMLE) Step 1, taken at the end of the 2nd year at medical school. It is in series with similar books on embryology and histology. There are 2 further steps, at the end of the 4th year and after the 1st year of postgraduate training.

Because USMLE contains clinical vignettes, the book is also clinically oriented. We could benefit by continuing clinical anatomy throughout the undergraduate curriculum. At present anatomy is too separated from its clinical application.

R. M. KIRK

*Textbook of Anatomy.* By R. KANAGASUNTHERAM, P. SIVANANDASIGHAM and A. KRISHNAMURTI. (Pp. xvi + 695; illustrated; £20 paperback; ISBN 0 86311 652 3.) London: Sangam Books. 1996.

I like this book—not the quality of paper which is thin and see-through, or the print which somehow looks dirty (perhaps because of the see-through paper)—but the content and style. It has an old fashioned feel to it which I like, and it does not in any way patronise the reader.

The text is arranged regionally. After a brief (22 page) introduction to concepts, planes, tissues, joints and nerves, the order of events is upper limb, trunk, lower limb, head and neck in general including spinal cord and brain, and, lastly, swallowing and ear, nose and throat. In view of the importance of ENT to general practitioners, paediatricians and parents, not to mention the poor little mites themselves, this has much to commend it. Basic neuroanatomy is included: not the stuff that some neuroanatomists teach about the second neuron from the sun on the pathway from the lesser spotted quangle-wangle nucleus, but important stuff like sensory and motor tracts that is clinically useful. Applied anatomy and other clinical points are dealt with in highlighted boxes. Learning objectives are given at the end of each chapter. Line diagrams are clear, there are one or two colour diagrams (why bother?) and a few radiographs at the end of the book. There are no cross-sections—a pity. There is some mention of phylogenetic considerations to put us in our place amongst the other segmented vertebrates: anything to lessen the arrogance of the human race is a good thing.

There is a fair bit of text that could be pruned. We really don't need descriptions of the interosseous surface of the radius, for example: anyone who needs this sort of detail can look it up in a bigger book. We don't need descriptions of many individual muscles: some—yes, but on the whole students (and others) can get by knowing only muscle groups. Origins and insertions are given: these too could be ditched.

The book is straightforward and uncomplicated. I don't recommend any single book to my students, but this one is as good as many and better than some so it joins the list.

W. S. MONKHOUSE

*Student Workbook for Understanding Human Structure and Function.* By VALERIE C. SCANLON and TINA SAUNDERS. (Pp. xii + 356; illustrated; £14.95 paperback; ISBN 0 8036 0242 1.) Philadelphia: F. A. Davis. 1997.

This is a companion to a textbook which I have not seen. I assume that it is aimed not at medical students but at nurses, therapists and other paramedical students. It covers all the basic sciences including a little pathology and consists in the main of statements with missing words which the student has to supply and multiple choice tests. There is a key at the back of the book. The notion of the book is good and if you like the regimented way of learning that is fashionable in some quarters, then the book may suit you. But be warned: it encourages a blinkered view that questions have only one right answer and that there is only one correct way of completing a statement. It does not encourage students to analyse, to think or to speculate. I remember being outraged as a 9-year-old at primary school because the teacher's answer book allowed only one answer in cases where there were several correct answers; the teacher agreed with me

that alternative answers were just as acceptable but nevertheless denied me the credit. This, judging from the tone and style, is such a book. In this regard it does not match the aspiration (understanding) of its title.

There are many statements with which I could take issue. 'The simplest living level [what does this mean?] of organization is the cellular level.' This book names the pleural and peritoneal cavities together as the ventral cavity, and the cranial cavity and spinal canal (bony? dural? subarachnoid?) as the dorsal cavity: I have never heard of these definitions and do not like them. 'The lateral end of a fallopian tube encloses the ovary.' I could go on with a list of statements that are simplified to the point of being wrong; the pity is that it is no more difficult, and a good deal less confusing, to word them so they are right. My experience is that students do not like this sort of condescension: neither do I.

W. S. MONKHOUSE

*Anatomy: A Regional Atlas of the Human Body*, 4th edn. By CARMINE D. CLEMENTE. (Pp. xii + 620; 576 plates; £34.95 paperback; ISBN 0 683 23100 6.) Baltimore and London: Williams & Wilkins. 1997.

A new edition of the Clemente Atlas is welcome. This one joins the list of good atlases and many of my students use it. Apart from coloured and line diagrams there are radiographs, scans and cross sections—good—and mention of important sites of commoner anatomical anomalies—also good. It is, as one might expect, a detailed text of topographical anatomy: there is no CNS, no embryology and no histology. The book's excellence is obvious and I must emphasise that the few criticisms I offer in no way detract from my admiration for the book. It is, once again, straightforward old-fashioned anatomy and students on many courses would not need another book for regional anatomy assuming that their taught course was sufficiently directed and focused. The problem with it is that no attempt is made to sort out what matters clinically, and why, from what does not. Students could well be left floundering, fuddled by detail. With a well directed taught course, this would not matter but in these days of courses which are help-yourself-when-you-like courses, otherwise known as student-centred, problem-based (if I were a student paying fees for these courses I would feel that I was not getting value for my fees and that the staff were failing in their duty of care by telling me to read some guidelines and get on with it myself), this might prove troublesome. But I hope not: the book is good. A trifle expensive, perhaps?

W. S. MONKHOUSE